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APPLICANT : NARD INST LTD;

INVENTOR : MATOBA NORIKO;

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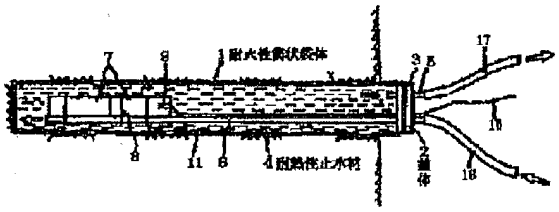
TITLE : BAG FOR LOADING EXPLOSIVE IN BLASTING DEVICE



ABSTRACT : PURPOSE: To provide a bag body for loading explosive in blasting device for rapturing remaining pig iron in a blast furnace to be repaired through blasting.

CONSTITUTION: A tubular bag body 1, into which explosive is loaded, is made of textile made of fire resistant and heat resistant fibers such as ceramic fibers and the like, while heat resistant water stopping material 4, such as silicon rubber and the like, is stuck to the inner surface of the same through coating. The length and the diameter of the bag body is formed so as to be larger than the depth and diameter of a blasting hole 11 and the bag is inserted into the blasting hole 11 after loading explosive 7 into the tubular bag body 1, then, the explosive is exploded under a condition that cooling water is supplied into the bag body 1 to expand it.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] In case this invention repairs the superannuated shaft furnace, it relates to the bag body for explosives loading in the blasting equipment for destroying elevated-temperature **** in a furnace by shot.
[0002]
[Description of the Prior Art] Although the hearth and furnace wall of a shaft furnace have the structure which carried out the laminating of an outer steel shell, a stave cooler, and the firebrick one by one from the outside, it will be the life of a firebrick for about 15 years, therefore it is necessary to do the repair activity of a shaft furnace periodically. Although repair is preceded and this **** is cooled and solidified since molten iron remains in a blast furnace bottom and it has become **** on the occasion of this repair, **** in the time of solidifying is an elevated temperature more than 600 **, and 2000-3000kg/cm2 and compressive strength have that tensile strength more than it, and it is very difficult to remove.
[0003] For this reason, after drilling borehole in **** from the former, making **** destroy is performed by loading with and exploding an explosives in this borehole. Under the present circumstances, although the porous wall of borehole has been cooled with water before loading since there is a possibility that an explosives, especially a detonator may explode for hot ****, long duration will be required for making it cool a porous wall below to the heat-resistant temperature of an explosives and a detonator, and the working capacity for shaft furnace repair will fall.
[0004] Then, the approach of exploding by loading borehole with what inserted in the explosives and the detonator in the metal cylinder which has prepared thermal breaks, such as asbestos, and the method of making borehole insert and explode a double pipe, sealing with stemming materials, such as sand, and supplying cooling water to the space section of inside-and-outside tubing, while inserting an explosives and a detonator in the interior of the inner tube of a metal double pipe are developed.
[0005]
[Problem(s) to be Solved by the Invention] However, in order according to the former approach not to acquire adiabatic efficiency sufficient in thermal breaks, such as asbestos, to enable positive insertion to borehole for a problem not only to to arise at safety, but and fully to have to form the path of borehole in a major diameter as compared with a metal pipe diameter, an opening is formed between the wall of borehole, and the peripheral face of a metal cylinder, and there is a problem that shot effectiveness falls.
[0006] On the other hand, since metal tubing is used, when it becomes impossible to insert in therefore even if slight deflection has arisen in borehole, and it makes the aperture of borehole into a major diameter like the former approach and the charge of this metallic conduit enables it to carry out according to the latter approach, an opening will be formed between the porous wall of borehole, and the peripheral face of a metallic conduit, and shot effectiveness will fall. Moreover, in a metal double pipe, it is heavy, and is hard to deal with it, and there is a trouble of reducing workability. This invention aims at offer of the bag body for explosives loading in the blasting equipment which can cancel such a trouble extensively.
[0007]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the bag body for explosives loading in the blasting equipment of this invention In the blasting equipment constituted so that it might be made to explode in elevated-temperature borehole, supplying water while loading with an explosives into the bag body which the tip sealed, the above-mentioned bag body is a major diameter from borehole. And it is formed in the Sai chief tubed bag which has flexibility of fire-resistance and heat-resistant fiber, such as a ceramic cross, and has the structure which comes to carry out coating and adhesion of the heat-resistant water cutoff material, such as silicone rubber, in the inside.
[0008]
[Function] After loading with an explosives into a tubed bag body, opening of this bag body is sealed with a proper lid, and this bag body is inserted into the borehole currently drilled in the **** proper place of a shaft furnace. Since a tubed bag body has flexibility, even if deflection has arisen in borehole, it can be inserted easily. Arrange the cooling water supply pipe and the drain pipe in the lid in the state of penetration beforehand, and lead, the supply pipe is made full [pour in and] of cooling water in a bag body, and it is water cutoff material about an inside. If coating and this pasted-up bag

body are expanded and it is made close to the porous wall inside of borehole, since the bag body is formed from fireproof fiber, the explosives with which it has loaded into **** is held in the heat insulation condition from elevated temperature ****, discharging outside the cooling water which carried out endoergic [of the elevated temperature from a **** side], and carried out the temperature up through an exhaust pipe with the cooling water which flows the inside of this bag body, while fully being able to bear to elevated temperature ****. A part of **** is destroyed by exploding an explosives in this condition.

[0009]

[Example] next -- if the example of this invention is explained about a drawing -- 1 -- the die length and the path of borehole 11 -- ****** -- while being the Sai chief tubed bag body which has the flexibility currently formed in a large path and die length and having sealed the tip putting firmly on the peripheral face of the bag body open end which has covered this lid 2 with the proper binding implements 3, such as a band, while opening of the end face side is carried out and the opening edge inserts in a lid 2 -- a watertight condition -- ****** -- it constitutes like.

[0010] ** woven in the shape of [which this tubed bag body 1 has been formed from the cross which has refractoriness, and the tip sealed by fire-resistance and heat-resistant fiber] a cylindrical shape -- or a fireproof rectangle-like cross can be incurvated in the shape of a cylinder, that opposite edge can be made to be able to unify by adhesion etc., a tubed cross can be formed, and it can produce by attaching the fireproof cross of a circle configuration in the opening edge of one of these by adhesion etc. at one.

[0011] As fireproof fiber which constitutes the tubed bag body 1, they are carbon fiber (decomposition temperature of 3600 degrees C), and fire resistance-ized carbon fiber (decomposition temperature 500 **). There are ceramic fiber (melting point of 1300 degrees C), a glass fiber (melting point 700 **), high silica glass fiber (melting point 900 **), etc., coating and adhesion of the heat-resistant water cutoff material 4 which has flexibility, such as silicone rubber and Teflon, are done all over the inside of the tubed bag body 1 woven by such fireproof fiber, and the water cutoff layer is formed.

[0012] In said lid 2 with which the opening edge of this tubed bag body 1 is equipped It has attached in the condition of having made the cooling water drain pipe 5 which consists of a short pipe, and the upright cooling water supply pipe 6 with which a tip consists of long tubing which reaches even near the point of this bag body 1 when a lid 2 is attached in the tubed bag body 1 penetrating watertight, and some explosiveses 7 enclosed in the paper bag or the cardboard tube on the point of this cooling water supply pipe 6 are arranged, and it has fixed to the cooling water supply pipe 6 with the proper binding implements 8, such as a band. Furthermore, the back end of an explosives 7 is equipped with the detonator 9, and the tip of the curved line 10 which penetrated this lid 2 watertight from the exterior of a lid 2, and was introduced in the tubed bag body 1 is made to have connected with this detonator 9.

[0013] In order to load with an explosives 7 into the tubed bag body 1, while being able to load into the point of a bag body 1 easily by inserting into a bag body 1 with the end face section of the long picture cooling water supply pipe 6 By a lid's 2 arriving at the opening edge of a bag body 1, and attaching this lid 2 in this opening edge, an opening edge is sealed and the blasting equipment which comes to load an explosives 7 into a bag body 1 is obtained in this way.

[0014] Thus, first, in order to use the constituted blasting equipment and to destroy **** of the superannuated shaft furnace, after exposing a part of outer steel shell 13 of a shaft furnace 12, and a part of **** 15 which is carrying out deposition union by proper mechanical destruction etc. removing a stave cooler and a firebrick 14 at the pars basilaris ossis occipitalis in a shaft furnace, two or more boreholes 11 are drilled in **** 15 using a proper punch. The path of this borehole 11 will be drilled in a minor diameter rather than it, if the outer diameter of the above-mentioned tubed bag body 1 is about 65mm.

[0015] Moreover, the cooling water supply hose 16 and the exhaust hose 17 are connected to the end face of the cooling water supply pipe 6 and drain pipe 5 which penetrate to the lid 2 of blasting equipment and protrude outside, respectively. The tubed bag body 1 of this blasting equipment is inserted into borehole 11 the appropriate back. In addition, before inserting the tubed bag body 1 into borehole 11, it is desirable when putting in little water in a bag body 1 through the cooling water supply pipe 6, and eliminating the air in **** 1 heightens a destruction effect.

[0016] Since the tubed bag body 1 is formed from the flexible flexible material, even if a concave convex and deflection have arisen in the wall of borehole 11, it can be inserted smoothly, without receiving any failure. In addition, after facing inserting the tubed bag body 1 into borehole 11, pouring in water into this borehole 11 and making this borehole 11 cool to some extent, the tubed bag body 1 may be inserted. Moreover, if temperature detection means, such as a thermostat label, are attached to the cooling water drain pipe 5, the temperature in borehole after the time of insertion or insertion

can be detected and checked easily, and the flow rate of cooling water can be adjusted.
[0017] If cooling water is immediately fed in the tubed bag body 1 through a supply pipe 6 from the cooling water supply hose 16 after insertion, inserting this tubed bag body 1 into borehole 11, With the cooling water impregnated with the tubed bag body 1, it expands in the outer-diameter direction and makes the peripheral face close to the wall of borehole 11 while cooling water is poured in into the tubed bag body 1 from the tip of a supply pipe 6, and it is full of it in this tubed bag body 1, it engrosses an explosives 7 and a detonator 9 into this cooling water and does a heat insulation operation so to the elevated temperature from a borehole 11 side.
[0018] Furthermore, the cooling water which it pours in and is full of in the tubed bag body 1 is discharged outside through an exhaust hose 17 from this drain pipe 5, flowing and carrying out a temperature up to the drain pipe 5 side which the back end lid 2 in the tubed bag body 1 is made to penetrate, carrying out endoergic [of the elevated temperature from the **** side transmitted to the tubed bag body 1]. Thus, the explosives 7 and detonator 9 with which it has loaded into this tubed bag body 1 are held in the heat insulation condition from elevated-temperature **** with the flowing cooling water which was poured in into the tubed bag body 1.
[0019] in addition -- in order to make this tubed bag body 1 produce desired expansion pressure and to stick the tubed bag body 1 to the porous wall of borehole 11 with the cooling water poured in into the tubed bag body 1, or it forms a drain pipe 5 in a minor diameter rather than the cooling water supply pipe 6 -- or wastewater -- ** -- means, such as extracting suitably, adjust the pressure by the side of wastewater so that it may become high.
[0020] A part of **** is made to destroy by connected and energizing lead wire and a bus-bar (not shown) to the curved line 10 which changed into this condition and has been projected outside from the lid 2 of the tubed bag body 1, and exploding an explosives 7. In addition, in the above-mentioned example, although the cooling water supply pipe 6 was formed in long tubing and the cooling water drain pipe 5 was formed in the short pipe, even if reverse in this, it is good. If it does in this way, when borehole 11 is drilled in slanting facing up, since air does not remain in the tubed bag body 1, the direction which uses a short pipe as a cooling water supply pipe, and uses long tubing as a cooling water drain pipe is desirable. Moreover, even if it does not necessarily attach an explosives 7 in long tubing, you may fix to the special rod-like structure which penetrates a lid 2.
[0021]
[Effect of the Invention] While loading with an explosives as mentioned above into the bag body which the tip sealed according to the bag body for explosives loading in the blasting equipment of this invention in the blasting equipment constituted so that it might be made to explode in elevated-temperature borehole, supplying water The above-mentioned bag body is formed in the Sai chief tubed bag which is a major diameter and has flexibility by fire-resistance and heat-resistant fiber, such as a ceramic cross, rather than borehole. Since it comes to carry out coating and adhesion of the heat-resistant water cutoff material, such as silicone rubber, at the inside and the tubed bag body has flexibility It can insert easily, deforming according to the wall configuration of this borehole, without receiving any failure, even if a concave convex, deflection, etc. have arisen in the wall of borehole.
[0022] Furthermore, a tubed bag body is while being able to protect the explosives with which can fully bear and the interior is loaded from an elevated temperature, without damaging to elevated-temperature **** since it is formed from fire-resistance and heat-resistant fiber, It will be in coating and the condition that could carry out impregnation fullness, could carry out endoergic [of the elevated temperature from a **** side], without making cooling water leak outside in a bag body since it had pasted up, and moreover and an explosives were absorbed into cooling water to the inside about heat-resistant water cutoff material, such as silicone rubber, and an explosives can be held in the heat insulation condition from elevated-temperature ****.
[0023] Moreover, it is since the path of a tubed bag body which has flexibility is formed in a major diameter rather than borehole, If cooling water is supplied in this bag body, while a bag body can expand, and being able to make the peripheral face close in borehole, therefore being unable to generate a clearance between a tubed bag body and borehole and being able to raise shot effectiveness remarkably Since cooling water can be made full in this bag body, expanding the tubed bag body inserted into this borehole by impregnation of cooling water when borehole is drilled in slanting facing up, a shot activity can always be done on insurance.

Claim(s)]
[Claim 1] It is a bag body for explosives loading in the blasting equipment which has been formed in the Sai chief tubed bag which the above-mentioned bag body is a major diameter from borehole in the blasting equipment constituted so that it might be made to explode in elevated-temperature borehole, and has flexibility by fire-resistance and heat-resistant fiber, supplying water while loading with an

explosives into the bag body which the tip sealed, and is characterized for heat-resistant water-cutoff material by coating and to have pasted up at the inside.
[Claim 2] A **** tubed bag Is a bag body for explosives loading in the blasting equipment according to claim 1 characterized by being woven by tubed by heat-resistant crosses, such as a ceramic cross, a carbon cross, and a fire resistance-ized carbon cross.
[Claim 3] Heat-resistant water cutoff material is a bag body for explosives loading in the blasting equipment according to claim 1 characterized by being silicone rubber.